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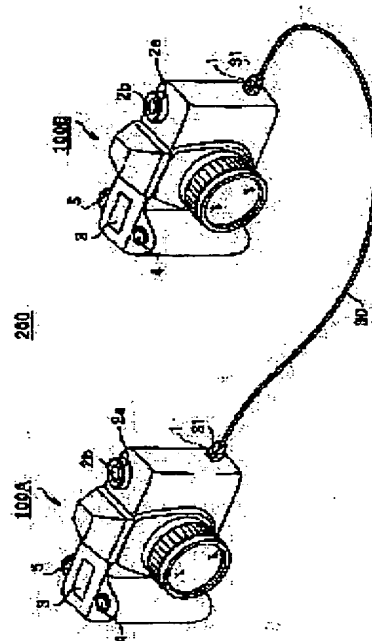
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(54) PHOTOGRAPHING SYSTEM

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a photographing system constituted so that the release timing of two or more cameras set at distant positions can be optionally controlled by the operation of one camera, the substantial number of photographing frames can be increased and an effect being identical to the effect of a high-speed continuous photographing time can be obtained.

SOLUTION: This photographing system 200 is provided with at least the 1st camera 100A and the 2nd camera 100B. The 1st camera 100A is provided with a 1st photographing means 20, an operation means 4, a 1st transmission means 1 transmitting a release signal for instructing release to the 2nd camera 100B and a control means 10 transmitting the release signal to the 2nd camera 100B by using the transmission means 1 in accordance with the prescribed operation of the operation means 4. The 2nd camera 100B is provided with a 2nd photographing means 20 and a 1st receiving means 1 receiving the release signal from the 1st camera 100A. Then, the 2nd photographing means 20 executes photographing when it receives the release signal from the 1st camera 100A.



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CLAIMS

[Claim(s)]

[Claim 1] A photographing system which it has the following, and said 2nd camera has the 2nd photographing device and the 1st reception means that receives said release signal from said 1st camera, and is characterized by said 2nd photographing device performing photography if a release signal is received from said 1st camera.

Having the 1st camera and 2nd camera at least, said 1st camera is the 1st photographing device. A control means.

The 1st transmitting means that transmits a release signal which directs release to said 2nd camera. A control means which transmits a release signal to said 2nd camera by said transmitting means according to predetermined operation of said control means.

[Claim 2] The photographing system according to claim 1, wherein said control means performs photography by said 1st photographing device, and transmission of a release signal by said 1st transmitting means by turns according to predetermined operation of said control means.

[Claim 3] From a non-operating state, said predetermined operation is said control means operation which shifts to an operating condition, and said control means, The photographing system according to claim 2 characterized by performing transmission of photography by said 1st photographing device, and a release signal by said 1st transmitting means by turns whenever said control means shifts to an operating condition from a non-operating state.

[Claim 4] Said predetermined operation is said control means operation held in the predetermined state, and said control means, The photographing system according to claim 2 characterized by performing photography by said 1st photographing device, and transmission of a release signal by said 1st transmitting means by turns all the time while said predetermined state is held.

[Claim 5] From a non-operating state, said predetermined operation is said control means operation which shifts to an operating condition, and said control means, The photographing system according to claim 2 which will be characterized by only prescribed frequency performing photography by said 1st photographing device, and transmission of a release signal by said 1st transmitting means by turns if said control means shifts to an operating condition once from a non-operating state.

[Claim 6] The photographing system according to claim 5, wherein said 1st camera has a number-of-times setting-out means to set up said prescribed frequency arbitrarily.

[Claim 7] The photographing system comprising according to any one of claims 4 to 6:

Timing which performs photography according [said 1st camera] to said 1st photographing device.

A timing setting means to set up arbitrarily timing which performs transmission of a release signal by said 1st transmitting means, respectively.

[Claim 8] Have the 2nd transmitting means that transmits a release preparation-completion signal which tells that preparation of release completed said 2nd camera to said 1st camera, and said 1st camera, The photographing system according to any one of claims 1 to 7 characterized by not performing transmission of a release signal by said 1st transmitting means until it has further the 2nd reception means that receives a release preparation-completion signal and said control means receives a release preparation-completion signal.

[Claim 9] The photographing system according to claim 8 after said 1st camera's transmitting a predetermined acknowledge signal to said 2nd camera, and receiving said predetermined acknowledge signal, wherein said 2nd camera transmits a release preparation-completion signal to said 1st camera by said 2nd transmitting means.

[Claim 10] Have the following, have said 2nd camera and the 2nd photographing device and the 1st

reception means that receives said release signal from said 1st camera said control means, After performing 1st photography by said 1st photographing device and going through interval ΔT_1 , transmission of a release signal by said 1st transmitting means is performed, After performing 1st photography by said 1st photographing device and going through interval ΔT_2 , perform 2nd photography by said 1st photographing device, and said 2nd photographing device, A photographing system which will perform photography if a release signal is received from said 1st camera, and is characterized by said interval ΔT_1 and said interval ΔT_2 being each variable.

Having the 1st camera and 2nd camera at least, said 1st camera is the 1st photographing device.
A control means.

The 1st transmitting means that transmits a release signal which directs release to said 2nd camera.
A control means which performs photography by said 1st photographing device, and transmission of a release signal by said 1st transmitting means according to predetermined operation of said control means.

[Claim 11] A camera with a communication function characterized by comprising the following.

A photographing device.

A control means.

A transmitting means which transmits a release signal to other cameras.

A control means which performs photography by said photographing device, and transmission of a release signal by said transmitting means according to predetermined operation of said control means.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the photographing system which can be communicated by at least two cameras about release when taking a photograph.

[0002]

[Description of the Prior Art] From the former, a photograph may be taken using two or more cameras of the same kind. For example, the case where two or more cameras tend to be arranged in the position which separated, and it is going to photo a photographic subject from a different angle can be considered.

[0003] In this case, it is impossible to carry out release of the two or more cameras which have a user in the position which separated to arbitrary timing. Therefore, it is only possible to carry out release of the two sets simultaneously in recent years using the connecting cord etc. which connect cable release or cameras.

[0004] However, in the bottom of the situation of photoing to a user photographic subjects which a situation changes every moment, such as a train and a sport player, There are a request of carrying out release only of the camera of one between two or more cameras currently used, and a request of liking to shift the release of this camera beyond 2 set fixed time respectively, and to take a photograph by turns.

[0005] In order to always carry out release of the two cameras simultaneously by the above-mentioned cable release or a connecting cord to these requests, there is a problem that it cannot fully respond to a user's needs. Since a film is vainly consumed if release of two or more cameras is further always carried out simultaneously, efficient photography cannot carry out economically.

[0006] A seriography may be performed using one camera. In a seriography, it is desirable to make a seriography at high speed, i.e., there are many photography tops per unit time. However, there was a late thing of the lifting speed of a film depending on the kind of camera, and even if it was such a camera, there was a request of the user who would like to perform a seriography at high speed.

[0007] When the 35-mm film which is often generally used and which is filmed 36 sheets was used in furthermore performing a seriography, it finished taking by number of sheets immediately, and the film had to be exchanged briskly and there was a problem of taking time and effort.

[0008]

[Problem(s) to be Solved by the Invention] Then, this invention can control arbitrarily the release timing of two or more cameras at the distant place by operation of one camera in view of many above-mentioned situations, and increase the substantial number of photography tops, and. It aims at providing the photographing system which can acquire the same effect as the time of performing a seriography at high speed.

[0009]

[Means for Solving the Problem] For this reason, the photographing system according to claim 1 is provided with the 1st camera and 2nd camera at least. And the 1st transmitting means that transmits a release signal with which the 1st camera instructs release to be the 1st photographing device and a control means to the 2nd camera. According to predetermined operation of this control means, have the 1st control means that transmits a release signal to said 2nd camera by said transmitting means, and the 2nd camera, Photography will be performed, if it has the 2nd photographing device and the 1st reception means that receives a release signal from the 1st camera and the 2nd photographing device receives a release signal from said 1st camera. According to the photographing system according to claim 1, release only of the 2nd camera can be carried out by pushing a release button of the 1st camera.

[0010]It is also possible to carry out release of the 1st camera and 2nd camera by turns (claim 2).

[0011]According to the photographing system according to claim 3, the above-mentioned predetermined operation, It is the operation which repeats shifting a control means to an operating condition from a non-operating state, and the above-mentioned control means can perform transmission of photography by the 1st photographing device, and a release signal by the 1st transmitting means by turns, whenever a control means shifts to an operating condition from a non-operating state.

[0012]According to the photographing system according to claim 4, the above-mentioned predetermined operation, It is operation of holding a control means in the predetermined state, and the above-mentioned control means can perform photography by the 1st photographing device, and transmission of a release signal by the 1st transmitting means by turns all the time, while this predetermined state is held.

[0013]According to the photographing system according to claim 5, the above-mentioned predetermined operation, It is one operation made to shift to an operating condition from a non-operating state, and if this operation of 1 time is performed, as for the above-mentioned control means, only prescribed frequency can perform photography by the 1st photographing device, and transmission of a release signal by the 1st transmitting means by turns.

[0014]It is desirable to have a number-of-times setting-out means of release by which the 1st camera sets up the above-mentioned prescribed frequency arbitrarily at a photographing system concerning this invention (claim 6). It is still more desirable for this 1st camera to have a timing setting means to set up arbitrarily timing which performs photography by the 1st photographing device, and timing which performs transmission of a release signal by the 1st transmitting means, respectively (claim 7).

[0015]The photographing system according to claim 8 the 2nd camera, It has the 2nd transmitting means that transmits a release preparation-completion signal which tells that preparation of release was completed to the 1st camera, The 1st camera has the 2nd reception means that receives a release preparation-completion signal, and a control means of the 1st camera does not perform transmission of a release signal by said 1st transmitting means until it receives a release preparation-completion signal.

[0016]According to this photographing system, since a release signal is transmitted to the 2nd camera after checking that the 2nd camera has completed release preparation, photography with the 2nd camera formed in a place distant from the 1st camera can also perform a control means of the 1st camera certainly.

[0017]In the photographing system according to claim 8, the 1st camera transmits a predetermined acknowledge signal to the 2nd camera, and the 2nd camera transmits a release preparation-completion signal to this 1st camera by the 2nd transmitting means, after receiving an acknowledge signal predetermined [this] (claim 9).

[0018]According to the photographing system according to claim 10, it has the 1st camera and 2nd camera at least. And the 1st transmitting means that transmits a release signal with which the 1st camera instructs release to be the 1st photographing device and a control means to the 2nd camera, A control means which performs photography by the 1st photographing device, and transmission of a release signal by the 1st transmitting means according to predetermined operation of a control means, It has a transmission interval setting-out means to set up arbitrarily interval ΔT_1 of photography by the 1st photographing device, and transmission of a release signal by the 1st transmitting means, and a photographing interval setting-out means to set up arbitrarily interval ΔT_2 of the 1st photography and the 2nd photography by a photographing device. The 2nd camera is provided with the following. The 2nd photographing device.

The 1st reception means that receives a release signal from the 1st camera.

After performing 1st photography by the 1st photographing device and this control means goes through interval ΔT_1 , it performs transmission of a release signal by said 1st transmitting means, After performing 1st photography by said 1st photographing device and going through interval ΔT_2 , 2nd photography by said 1st photographing device is performed, and this 2nd photographing device will perform photography, if a release signal is received from the 1st camera.

[0019]

[Embodiment of the Invention]Hereafter, the embodiment of this invention is described. Drawing 1 is a schematic diagram showing the photographing system 200 concerning this invention. The photographing system 200 comprises the camera 100A with a communication function (only henceforth a camera), the camera 100B, and the cable 30. Drawing 2 is a block diagram showing the photographing system 200.

[0020]As drawing 1 shows, the camera 100A has the contact button 1, the mode dial 2a, mode button 2b, LCD display 3, the release button 4, and the selection dials 5. As drawing 2 furthermore shows, the

camera 100A has the memory 6, CPU10, and the shutter mechanism 20, and the release button 4, the memory 6, and the shutter mechanism 20 are connected with CPU10, respectively. As for LCD display 3, the mode dial 2a, mode button 2b, and the selection dials 5 are connected with CPU10 for the contact button 1 via the driver 9 via the interface 8 via the interface 7, respectively. Since the composition of the camera 100B is the same as the composition of the camera 100A, explanation is omitted.

[0021]CPU10 recognizes the contents (for example, exposure mode, photographing mode, etc.) which a user sets up using the mode dial 2a, mode button 2b, and the selection dials 5 via the interface 8. It is made to display on LCD display 3 furthermore by CPU10 using as data a setting detail, the contents of processing which are set up and in which a current line is, etc., and transmitting to the driver 9. Therefore, the user can perform various setting out, photography, etc., checking the contents of processing, and the situation of setting out by the eye by LCD display 3 (refer to drawing 3).

[0022]As for the cable 30, the connector 31 is formed in both ends. By inserting each connector 31 in each contact button 1 of the camera 100A and the camera 100B, the camera 100A and the camera 100B are electrically connected, and bidirectional communication about release is enabled.

[0023]Usually, if each release button 4 is pressed fully when using the camera 100A or the camera 100B alone, CPU10 directs release only to each shutter mechanism 20 within each camera 100A and 100B. However, in connecting using the cable 30, operating the communication function of both cameras and taking a photograph so that it may mention later, While becomes a main machine, and if the release button 4 of a camera is pressed fully, CPU10 of this main machine will transmit a release signal to CPU10 of the camera of another side which it not only directs release, but becomes the shutter mechanism 20 of a self-opportunity with a sub opportunity via the cable 30. That is, it becomes possible to also direct the release of a sub opportunity by operation of a main machine.

[0024]In this specification, for convenience, the camera 100A is used as a main machine, and the camera 100B is explained as a sub opportunity. Especially the following is explanation about the camera 100A which is a main machine, as long as it is unstated.

[0025]Next, setting out of photography environment is explained. Drawing 3 is a transition diagram showing the display information of LCD display 3 in the case of setting up photography environment using the mode dial 2a, mode button 2b, and the selection dials 5. First, a user makes the power supply of both cameras one, after a power supply connects the cameras 100A and 100B in an OFF state by the cable 30.

[0026]According to a user's above-mentioned work, CPU10 of each cameras 100A and 100B operates a communication function automatically, and it displays the character of "COM" and "CHECK" on each LCD display 3 (D1). It means that the "COM" display takes a photograph using a communication function, and when the "CHECK" display performs photography by a communication function, it means doing the work which checks the release preparatory state of a sub opportunity.

[0027]When it is in the state of LCD display 3D1 and keeps [display / the "CHECK" character] made, the check mode for which the release preparatory state of the camera 100B is checked at the time of photography will be chosen. If the "CHECK" character is not displayed using the selection dials 5 of the camera 100A used as a main machine in the state of D1, the non-check mode which does not check the release preparatory state of the camera 100B at the time of photography will be chosen. Release preparation means winding up, shutter charge, etc. of a film, and the camera which release preparation has completed is in the state where release can be performed immediately.

[0028]If a check mode is chosen, since CPU10 directs release after checking that it will be in the state where the release of a self-opportunity and the camera 100B can be carried out, it can cut the shutter of both cameras certainly. On the other hand, if a non-check mode is chosen, CPU10 directs release at the same time the time of the request which the user always set up passes without checking whether it will be in the state where the release of a self-opportunity and the camera 100B can be carried out.

[0029]If the two modes are compared, about the point of the timing which directs release, it can be said that the non-check mode is more exact. However, about the point whether the shutter of both cameras can be cut as release instruction, it can be said that the check mode is trustworthier. Therefore, it is more desirable to usually choose a check mode.

[0030]If a user chooses the modes arbitrary about the check of the release state of the camera 100B and pushes mode button 2b, a photographing mode selection picture (D2-D4) will be displayed on LCD display 3. The check mode will be chosen all the display information shown in drawing 3.

[0031]In D2-D4, photographing mode is chosen by rotating the mode dial 2a. When using the camera 100A and the camera 100B alone, the photographing mode can begin 1 top photographing mode, and can choose it from various kinds, such as self-timer-photographing mode and multiplex photographing mode. However, when operating the communication function with the photographing system 200, photographing

mode will choose any one from seriography mode (D2; a 1st embodiment), interval photographing mode (D3; a 2nd embodiment), and 1 top photographing mode (D4; a 3rd embodiment). Hereafter, setting out is explained for every photographing mode.

[0032]The seriography mode (D2) which is a 1st embodiment is photographing mode to which release of each cameras 100A and 100B is carried out continuously. In drawing 3, if continuation (D2) is chosen and mode button 2b is pushed once by the selection dials 5, the detailed setting screen (D2a) in seriography mode will be displayed, and the seriography method will be set up. In this embodiment, the seriography method has two kinds such as Normal and a synchronization.

[0033]It is the seriography method which continues taking out release instruction by turns, taking the interval (ΔT_0) beforehand determined to each cameras 100A and 100B, while Normal is pressing the release button 4 fully, The same effect as the case where high-speed continuous shooting is performed using the quick camera of winding up of what is called a film can be acquired. In this embodiment, as mentioned above, the main machine and sub opportunity is using the camera of the same kind. Therefore, ΔT_0 is set as 1/2 of the time of time required in order that the camera 100A (and camera

100B) may make release preparations so that other cameras can complete release preparation and a seriography can make full use of time there be nothing while the camera of one is carrying out release.

[0034]With a synchronization, although operation of the release button 4 is the same as Normal, it is the seriography method to which release of the two cameras 100A and 100B can be carried out simultaneously. If synchronization photography is performed, a seriography can be performed from an angle which is different to the same timing.

[0035]In a detailed setting screen (D2a), a user chooses one from the two above-mentioned kinds of seriography methods by rotating the selection dials 5, pushes mode button 2b, and sets up the desired seriography method.

[0036]The interval photographing mode (D3) which is a 2nd embodiment, When a user presses fully and detaches the 1-time release button 4, it is the photographing mode to which only the desired number of times carries out release of each cameras 100A and 100B according to the release timing (time) and the release interval (time) which were set up by the work mentioned later. After a main machine carries out release of the release timing, it means a time lag until a sub opportunity carries out release here. A release interval means an interval until it carries out next release, after a main machine carries out release which is the 1st time.

[0037]In drawing 3, if an interval (D3) is chosen and mode button 2b is pushed once by the selection dials 5, the release timing setting screen (D3a) which sets up release timing will be displayed. 00 s (second) is expressed as a release timing setting screen (D3a) as a default. A user makes a numerical value fluctuate by rotating the selection dials 5, chooses desired release timing, pushes mode button 2b, and sets up desired release timing ΔT_1 .

[0038]At this embodiment, release timing can be set up from 0 s (second) to 12h (time) at a fixed interval. Here, if release timing ΔT_1 is set as 0 s, interval photography to which release of the two cameras 100A and 100B is carried out simultaneously can be performed. The unit displayed on LCD display 3 by continuing rotating the selection dials 5 in the one direction changes in order of s (second), m (minute), and h (time).

[0039]An end of setting out of release timing ΔT_1 will display the release interval setting screen (D3b) which sets up a release interval next. In a release interval setting screen (D3b), 01 s (second) is displayed as a default. Desired release interval ΔT_2 is set up according to the same work as the time of setting up release timing. At this embodiment, a release interval can be set up from 1 s (second) to 12h (time) at a fixed interval. The unit displayed on LCD display 3 by continuing rotating the selection dials 5 in the one direction changes in order of s (second), m (minute), and h (time).

[0040]An end of setting out of release interval ΔT_2 will display the number-of-times setting screen of release (D3c) which sets up the total number of times of the release of the camera 100A and the camera 100B. In the number-of-times setting screen of release (D3c), 1 (time) is displayed as a default. The desired number of times M of release is chosen and set up by the same work as the time of setting up release timing. In this embodiment, it is setting up possible from 1 time to 72 times in consideration of the maximum number of sheets of a 35-mm film. On a release timing setting screen (D3a), when release timing ΔT_1 is set as 0 s, since CPU10 counts simultaneously the release of the two cameras 100A and 100B during photography, the number of times of release can be accepted even times, and can be set up.

[0041]1 top photographing mode (D4) which is a 3rd embodiment, The user can do release of the two

cameras 100A and 100B by operation of 1 at the arbitrary times by the seriography method which takes out release instruction 1 time respectively by turns to each cameras 100A and 100B whenever a user presses the release button 4 fully once and detaches it.

[0042]An end of setting out of the seriography method (D2a) in seriography mode and setting out of the number of times of release in interval photographing mode (D3c) will tell a user about CPU10 being in the state where the setting-out end screen (D5) made it display on LCD display 3, and photography preparation was completed. If one top (D4) is chosen and mode button 2b is pushed once by the selection dials 5 in drawing 3 in order not to perform detailed setting out in particular, in choosing 1 top photographing mode, a setting-out end screen (D5) will be displayed on LCD display 3.

[0043]During setting out of the photography environment mentioned above, if selection of a check mode is performed and mode button 2b is pushed (D1 reference among drawing 3), CPU10 will transmit the communication confirmation signal (COM signal) which checks communicating about release to CPU10 of the camera 100B which is a sub opportunity. CPU10 also transmits the check signal which tells checking a release preparatory state simultaneously with a COM signal, when the check mode is chosen.

Drawing 9 is a flow chart showing the processing which CPU10 of the camera 100B performs in each embodiment. CPU10 of the camera (S201) 100B which received the COM signal will be in the state of standing by the directions from a main machine automatically as a sub opportunity from the camera 100A during the photography which used the communication function (S203). Therefore, in this embodiment, it is not necessary to carry out special setting out in the direction of the camera 100B.

[0044]The waiting signal which tells that CPU10 of the camera 100B which changed into the state of standing by the directions from a main machine, by processing of S203 is in the state where it stood by as a sub opportunity, to CPU10 of the camera 100A is replied (S205). And it is checked whether the check signal has also been received simultaneously with a COM signal from the camera 100A (S207). If the check signal is received (S207:YES), release processing (1) will be performed (S209) and the check signal will not be received (S207:NO), release processing (2) is performed (S211). The flow chart which showed release processing (1) of S209 is drawing 10, and the flow chart which showed release processing (2) of S211 is drawing 11.

[0045]Thus, various kinds which are explained below can be photoed by setting up photography environment. All release timing ΔT_1 set up in the seriography method and interval photographing mode which were set up in seriography mode is saved as an user datum in the memory 6. CPU10 reads an user datum at the time of photography, and it not only uses it in order to carry out release instruction, but is used as a default value at the time of setting up next photography environment.

[0046]Next, the processing which CPU10 of the camera 100A in the case of taking a photograph using the photographing system 200 concerning this invention performs is divided and explained for every embodiment.

[0047]The photography by seriography mode which is a 1st embodiment first is explained. When drawing 4 and drawing 5 carry out a seriography, they are the flow chart which showed the processing which CPU10 performs.

[0048]Drawing 4 is the flow chart which showed the processing which CPU10 performs, when the seriography method is set up normally. It is judged whether CPU10 in a waiting state (S1:NO) is in the state where release preparation of a self-opportunity is completed, when the release button 4 is pressed fully (S1:YES) until the release button 4 is pressed fully by the user (S3). And it directs to perform release to the shutter mechanism 20 as judging that release preparation is completed (S5). (S3:YES) Thereby, photography with the camera 100A is performed.

[0049]After directing release (S5), it is judged whether it is in the state where the release button 4 is still pressed fully (S7). If the release button 4 is not already being pushed (S7:NO), a terminate signal is transmitted to the camera 100B, and photography (S21) is ended.

[0050]On the other hand, when the release button 4 is in the state where it was still pressed fully, (S7:YES) and CPU10 counts predetermined interval ΔT_0 (S9). Next, if the check mode is set up (S11:YES), it will be judged whether the release preparation-completion signal (S235 reference among drawing 10) is received from the camera 100B (S13). If the release first call is received from the camera 100B (S13:YES), CPU10 will judge that release preparation of the camera 100B is completed, and it will transmit a release signal to CPU10 of the camera 100B (S15). Photography with the camera 100B is performed synchronizing with this release signal (S241 reference among drawing 10).

[0051]In S11, when the non-check mode is set up (S11:NO), CPU10 transmits a release signal to CPU10 of the camera 100B immediately, without judging completion of release preparation of the camera 100B (S15). Photography with the camera 100B is performed synchronizing with this release signal (S241 reference among drawing 11).

[0052]If processing which transmits a release signal to the camera 100B by S15 is performed, it will be judged whether CPU10 is in the state where the release button 4 is still pressed fully again (S17). If it judges that it is in the state where the release button 4 is pressed fully (S17:YES), after counting predetermined interval ΔT_0 (S19:YES), the processing from S3 will be repeated again.

[0053]Seriography processing is ended after transmitting a terminate signal to the camera 100B like the time of judging it as NO by S7 (S21), when it is judged that the release button is not already pressed fully by judgment of S17 (S17:NO).

[0054]Drawing 5 is the flow chart which showed the processing which CPU10 performs, when the seriography method is set as a synchronization. Processing until it judges whether it is in the state where the release button 4 was pressed fully by the user (S31:YES), and the self-opportunity has completed release preparation by him (S33) is the same as that of the time of normal setting out (S1, S3 reference among drawing 4).

[0055]If the check mode is set up when it is judged that release preparation of a self-opportunity is completed (S33:YES) (S35:YES), it will be judged whether the release preparation-completion signal (S235 reference among drawing 10) is received from the camera 100B (S37). If it judges that the release preparation-completion signal was received and release preparation of the camera 100B is also completed (S37:YES), A release signal is transmitted to CPU10 of the camera 100B at the same time it directs that CPU10 performs release to the shutter mechanism 20 of the camera 100A (S39). By processing of S39, the camera 100A and the camera 100B can cut a shutter simultaneously (S241 reference among drawing 10).

[0056]When the non-check mode is set up (S35:NO), in S35 CPU10, A release signal is transmitted to CPU10 of the camera 100B at the same time it directs to perform release to the shutter mechanism 20 of the camera 100A, without judging completion of release preparation of the camera 100B (S39). By processing of S39, the camera 100A and the camera 100B can cut a shutter simultaneously (S241 reference among drawing 11).

[0057]In S41, if the release button 4 judges whether it is in the state where it was still pressed fully and is in the state where it was pressed fully, like the processing of S7 or S17 at the time of normal setting out (refer to drawing 4), the processing from S33 will be repeated (S41:YES). Seriography processing is ended after transmitting a terminate signal to CPU10 of the camera 100B (S43), if the user is not already pushing the release button 4 (S41:NO).

[0058]Next, the processing which CPU10 of the camera 100B performs corresponding to the processing of above-mentioned CPU10 at the time of taking a photograph in seriography mode is explained using drawing 10 and drawing 11.

[0059]When the check signal is first received from the camera 100A, processing of CPU10 of the camera 100B in the case of taking a photograph by a check mode is explained. Drawing 10 is the flow chart which showed the release processing (1), and (the inside of drawing 9 and S209) which CPU10 of the camera 100B performs, when taking a photograph by a check mode.

[0060]CPU10 of the camera 100B will transmit a release preparation-completion signal to the camera 100A, if release preparation is completed (S231:YES) (S235). When it judges whether the terminate signal (inside [S43] S21 of drawing 4 and drawing 5) from the camera 100A was received after that and the terminate signal is not received (S237:NO), it is judged whether the release signal (inside [S39] S15 of drawing 4 and drawing 5) from the camera 100A was received (S239).

[0061]When the release signal (inside [S39] S15 of drawing 4 and drawing 5) from the camera 100A is received (S239:YES), CPU10 of the camera 100B repeats the processing from S231 again, after performing release instruction to the shutter mechanism 20 of the camera 100B (S241). On the contrary, when the release signal (inside S15 of drawing 4) from the camera 100A is not received (S239:NO), the processing from S237 is repeated, and it will be in a waiting state until a terminate signal (S237) or a release signal (S239) is transmitted from the camera 100A. In S237, when the terminate signal from the camera 100A is received (S237:YES), CPU10 of the camera 100B ends photographing processing (RET).

[0062]It is processing of CPU10 of the camera 100B in case the above takes a photograph by a check mode. On the other hand, when the check signal is not received from the camera 100A, the flow chart which showed the release processing (2), and (the inside of drawing 9 and S211) of CPU10 of the camera 100B in the case of taking a photograph by a non-check mode is drawing 11.

[0063]Processing (S235) which transmits the release preparation-completion signal under release processing (1) which the contents of the release processing (2) which CPU10 of the camera 100B performs when taking a photograph by a non-check mode mentioned above is not only performed, and all others are the same. Therefore, the altogether same number as the number (S231, S237-S241)

attached by drawing 10 is given to processing shown by drawing 11, and explanation is omitted.

[0064]The above is explanation of photography by the seriography mode of a 1st embodiment. If it sets up normally and a seriography is performed, as long as a user will continue pressing the release button 4 fully, CPU10 repeats processings from S3 to S19, and since CPU10 of the camera 100B will repeat the processings (S235 removes at the time of a non-check mode) from S231 to S241, it can continue by turns and can carry out release of the camera 100A and the camera 100B.

[0065]If it is set as a synchronization and a seriography is performed, as long as a user will continue pressing the release button 4 fully, CPU10 repeats processings from S33 to S41, and since CPU10 of the camera 100B will repeat the processings (S235 removes at the time of a non-check mode) from S231 to S241, it can carry out release of the camera 100A and the camera 100B continuously simultaneously.

[0066]Next, the photography by interval photographing mode which is a 2nd embodiment is explained. When drawing 6 and drawing 7 carry out interval photography, they are the flow chart which showed the processing which CPU10 performs.

[0067]Drawing 6 is the flow chart which showed the processing which CPU10 performs, when release timing ΔT_1 is set as values other than 0 s in interval photography. If a user presses fully and detaches the release button 4 (S51:YES), CPU10 will start the count of the number of times K of release, and it will set the number of times K to 1 (S53). It is judged whether release preparation of a self-opportunity is completed (S55).

[0068]When it is judged that release preparation is completed (S55:YES), CPU10 carries out release instruction to the shutter mechanism 20 (S57). Photography with the camera 100A is performed by this release instruction. Next, the number of times K of release is counted, and the number of times K is set to 2 (S59). When the number of times K (here 2) exceeds the desired predetermined number M (namely, $M=1$), only the predetermined number M, it means that release was performed (S61:YES), and CPU10 transmits a terminate signal to the camera 100B (S77), and it ends photography.

[0069]When the number of times K does not exceed the desired predetermined number M by S61 (S61:NO) ($M=2$ or more [Here]), CPU10 judges whether release timing ΔT_1 of the request memorized by the memory 6 from the release instruction performed by S57 has passed (S63). If release timing ΔT_1 has passed (S63:YES), when the check mode is set up (S65:YES), it is judged whether the release preparation-completion signal (S235 reference among drawing 10) was received from the camera 100B (S67). CPU10 will transmit a release signal to the camera 100B, if a release preparation-completion signal is received (S67:YES) (S69). Photography with the camera 100B is performed synchronizing with this release signal (S241 in drawing 10 reference).

[0070]In S65, when the non-check mode is set up (S65:NO), CPU10 transmits a release signal to CPU10 of the camera 100B immediately, without judging completion of release preparation of the camera 100B (S69). Photography with the camera 100B is performed synchronizing with this release signal (S241 in drawing 11 reference).

[0071]After transmitting a release signal to the camera 100B (S69), the number of times K of release is counted again, and the number of times K is set to 3 (S71). When the number of times K (here 3) exceeds the desired predetermined number M (namely, $M=2$), only the predetermined number M, it means that release was performed (S73:YES), and CPU10 transmits a terminate signal to the camera 100B (S77), and it ends photography. The number of times K does not exceed the desired predetermined number M (here). After release interval ΔT_2 of the request memorized by the memory 6 from the release instruction performed by S57 passes in or more $M=3$ case (S73:NO), the processing from S55 is repeated (S75:YES), and only the desired predetermined number M carries out release instruction.

[0072]Drawing 7 is the flow chart which showed the processing which CPU10 performs, when release timing ΔT_1 is set as 0 s. If release timing ΔT_1 is set as 0 s, it is possible to make the shutter turn off each cameras 100A and 100B simultaneously in interval photography.

[0073]If a user presses the release button 4 fully once and detaches it (S91:YES), Processing in which it is judged whether it is in the state where the number of times K of release was counted (S93), and the self-opportunity has completed release preparation (S95) is the same as that of the case (S55 out of [S51] drawing 6) where release timing ΔT_1 mentioned above is set as values other than zero.

[0074]however — when release timing ΔT_1 is set as zero, release preparation of a self-opportunity has completed CPU10 — judging (S95:YES) — it is judged whether next the check mode is set up (S97).

[0075]If the check mode is set up (S97:YES), it will be judged whether the release preparation—

completion signal (S235 reference among drawing 10) is received from the camera 100B (S99). When it is judged that the release preparation-completion signal was received and release preparation of the camera 100B is also completed (S99:YES), A release signal is transmitted to CPU10 of the camera 100B at the same time it directs that CPU10 performs release to the shutter mechanism 20 of the camera 100A (S101). By processing of S101, the camera 100A and the camera 100B can cut a shutter simultaneously (S241 reference among drawing 10).

[0076]When the non-check mode is set up (S97:NO), in S97 CPU10, A release signal is transmitted to CPU10 of the camera 100B at the same time it directs to perform release to the shutter mechanism 20 of the camera 100A, without judging completion of release preparation of the camera 100B (S101). By processing of S101, the camera 100A and the camera 100B can cut a shutter simultaneously (S241 reference among drawing 11).

[0077]Next, CPU10 counts the number of times K of release among 2 batch deed, and they set the number of times K to 3 (S103). And when the number of times K (here 3) exceeds the desired predetermined number M (namely, $M=2$), only the predetermined number M, it means that release was performed (S105:YES) and CPU10 transmits a terminate signal to the camera 100B (S109). The number of times K does not exceed the desired predetermined number M (here). After release interval ΔT_2 of the request memorized by the memory 6 from the release instruction performed by S101 passes in or more $M=4$ case (S105:NO), the processing from S95 is repeated (S107:YES), and only the desired predetermined number M carries out release instruction.

[0078]The processing which CPU10 of the camera 100B performs when taking a photograph by interval photographing mode is the same as the processing performed when taking a photograph in the already described seriography mode. That is, in taking a photograph by a check mode, it performs release processing (1) shown by drawing 10, and in taking a photograph by a non-check mode, it performs release processing (2) shown by drawing 11. Therefore, explanation is omitted.

[0079]The above is explanation of photography by the interval photographing mode of a 2nd embodiment. When interval photography is performed, by pressing the release button 4 fully once and detaching it (S51:YES), The release of both cameras can be made to be able to perform by turns until the sum total of the release of the two cameras 100A and 100B connected becomes the desired number of times (S61, S73) (S57, S69). And desired release timing ΔT_1 can be taken between the release of the camera 100A, and the camera 100B (S63). Desired release interval ΔT_2 can be taken between the release of the 1st [further] camera 100A, and the release of the 2nd camera 100A (S75).

[0080]If release timing ΔT_1 is set as 0 s and interval photography is performed, The release of both cameras can be made to be able to perform simultaneously, if a user presses the release button 4 fully once and detaches it (S91:YES) until the sum total of the release of the two cameras 100A and 100B connected becomes the desired number of times (S105) (S101). And desired release interval ΔT_2 can be taken between the 1st release and the 2nd release (S107).

[0081]Next, the photography by 1 top photographing mode which is a 3rd embodiment is explained. When drawing 8 carries out 1 top photography, it is the flow chart which showed the processing which CPU10 performs. It is judged whether after a user presses CPU10 in a waiting state (S121:NO) the release button 4 fully once, when it detaches (S121:YES), it is in the state where the self-opportunity has completed release preparation (S123). And it directs to perform release to the shutter mechanism 20 as judging that release preparation is completed (S125). (S123:YES) Thereby, photography with the camera 100A is performed.

[0082]It is judged whether CPU10 which carried out release instruction to the shutter mechanism 20 by S125 was detached after the user pressed the release button 4 fully once again (S127). until the release button 4 is pressed fully CPU10 — a waiting state — it is (S127:NO) — a release button presses fully again — having (S127:YES). If the check mode is set up (S129:YES), it will be judged whether the release preparation-completion signal (S235 reference among drawing 10) is received from the camera 100B (S131). If the release first call is received from the camera 100B (S131:YES), CPU10 will transmit a release signal to the camera 100B (S133). Photography with the camera 100B is performed synchronizing with this release signal (S241 in drawing 10 reference).

[0083]In S129, when the non-check mode is set up (S129:NO), CPU10 transmits a release signal to CPU10 of the camera 100B immediately, without judging completion of release preparation of the camera 100B (S133). Photography with the camera 100B is performed synchronizing with this release signal (S241 in drawing 11 reference).

[0084]CPU10 after release signal transmission will repeat the processing from S123, when it will be in a waiting state (S121:NO) and the release button 4 is pressed fully until the release button 4 is pressed

fully again (S121:YES).

[0085]The processing which CPU10 of the camera 100B performs when taking a photograph by 1 top photographing mode, Since transmission of a terminate signal is not carried out from CPU10 of the camera 100A, it is the same as that of the processing performed by 1st embodiment mentioned above and a 2nd embodiment among drawing 10 and drawing 11 except the point of always being judged as NO by processing of S237.

[0086]The above is explanation of photography by 1 top photographing mode of a 3rd embodiment. In order that CPU10 may perform release instruction (S125) of a self-opportunity, and release signal transmission (S133) to the camera 100B by turns whenever a user presses the release button 4 fully once and detaches it in desired timing if 1 top photography is performed, The shutter can be made to turn off the two cameras 100A and cameras 100B by operation of one camera by turns.

[0087]Although the sub opportunity also explains in each of above-mentioned embodiments using the camera with a communication function, as long as it is a camera with a communication function which requires a main machine for this invention at worst, a sub opportunity may be a camera which does not have a communication function. Since the preparatory state of release, etc. cannot simply be transmitted from a sub opportunity in the case of *Perilla frutescens* (L.) Britton var. *crispa* (Thunb.) Decne., it will be limited to a non-check mode at the time of photography.

[0088]The above is explanation of the embodiment of the photographing system 200 concerning this invention. Modification various in the range which is not limited to the above-mentioned embodiment and does not deviate from the main point of this invention is possible for the photographing system concerning this invention.

[0089]For example, in each of above-mentioned embodiments, although communicated using two sets, the camera 100A and the camera 100B, it is also possible to use two or more cameras and to provide two or more sub opportunities. Therefore, it is also possible to be the cable which branches to some on the way and is in the branching state, or to transform the cable 30 used for connection of both cameras cordless using infrared rays.

[0090]The camera of various kinds, such as the camera for the 35-mm films filmed 36 sheets or not only the camera for inside seal films but an APS camera and a digital camera, can be used for the camera used for this invention.

[0091]Therefore, ranges which can be set up, such as release timing and a release interval, and the other setting details of photography environment can be changed by the camera, a kind, a photography mode of a film to be used. For example, although the interval (ΔT_0) of the release of the main machine at the time of a seriography and a sub opportunity is beforehand set as 1/2 of the time of time required in order to make release preparations of the camera 100A (100B) in the above-mentioned embodiment, it is not limited to this. A user is able to set [interval ΔT_0 and] it as arbitrary numerical values at the time of photography configuration.

[0092]The photographing system concerning this invention does not need to have all of three sorts of photographing modes mentioned above. For example, it may be a photographing system which only the interval photographing mode of a 2nd embodiment has. The photographing system furthermore applied to this invention is not applied only to three sorts of photographing modes mentioned above. For example, if it is a photographing system which has self-timer-photographing mode, it will also become possible to use two or more cameras and to carry out self timer photographing for the photographic subject from a different angle simultaneously, or to carry out self timer photographing one by one with the set-up time lag.

[0093]Modification which provides the communication release dedicated buttons which can make the camera with a communication function used by this invention carry out release only of the sub opportunity always connected to the self-opportunity to each embodiment independently is also possible.

[0094]

[Effect of the Invention]The photographing system of this invention becomes possible [always performing release of two or more cameras continuously to fixed timing] by communicating the information about release under the photography environment of the request which the user set up, and between cameras as above-mentioned.

[0095]Therefore, for example, even if it is a camera which carries a seal film while high-speed continuous shooting was not completed since winding up of a high thing of image quality is late, when more than one connect using the photographing system concerning this invention, it can acquire the same photographing effect as the case where high-speed continuous shooting is performed.

[0096]By changing into the state where it was connected by more than one with the photographing

system concerning this invention, even if it is a camera which carries a film with little photography number of sheets, in order to carry out film exchange briskly in the middle of photography, it becomes unnecessary to interrupt an interval and interval photography can be performed for a long time.

[Translation done.]

* NOTICES *

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- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1]It is a schematic diagram showing the photographing system 200 of this invention.

[Drawing 2]It is a block diagram showing the photographing system 200 of this invention.

[Drawing 3]It is a transition diagram showing the contents displayed on LCD display 3 in the case of performing various setting out using the mode dial 2a etc.

[Drawing 4]It is the flow chart which showed the processing which CPU10 of the camera 100A at the time of setting up the photographing method of a 1st embodiment normally and carrying out a seriography performs.

[Drawing 5]It is the flow chart which showed the processing which CPU10 of the camera 100A at the time of setting the photographing method of a 1st embodiment as a synchronization, and carrying out a seriography performs.

[Drawing 6]It is the flow chart which showed the processing which CPU10 of the camera 100A at the time of setting release timing ΔT_1 of a 2nd embodiment as values other than 0 s, and carrying out interval photography performs.

[Drawing 7]It is the flow chart which showed the processing which CPU10 of the camera 100A at the time of setting release timing ΔT_1 of a 2nd embodiment as 0 s, and carrying out interval photography performs.

[Drawing 8]It is the flow chart which showed the processing which CPU10 of the camera 100A of a 3rd embodiment performs.

[Drawing 9]It is a flow chart showing the processing which CPU10 of the camera 100B of each embodiment performs.

[Drawing 10]When taking a photograph by a check mode, it is the flow chart which showed the release processing (1) which CPU10 of the camera 100B performs.

[Drawing 11]When taking a photograph by a non-check mode, it is the flow chart which showed the release processing (2) which CPU10 of the camera 100B performs.

[Description of Notations]

1 Contact button

2a Mode dial

2b Mode button

3 LCD display

4 Release button

5 Selection dials

10 CPU

20 Shutter mechanism

30 Connecting cable

31 Connector

100A and 100B Camera with a communication function

200 Photographing system

[Translation done.]

【発明が属する技術分野】この発明は、撮影に際して少なくとも2台のカメラがレリーズに關して通信をすることが可能な撮影システムに關する。

【0002】従来から、複数の同種のカメラを使用し、撮影を行うことがある。例えば、離れた位置に2台以上のカメラを配置し、異なるアングルから被写体を撮影しようとする場合が考えられる。

【0003】この場合、ユーザが、離れた位置にある2台以上のカメラを任意のタイミングでレリーズすること不可避である。そのため近年、ケーブルレリーズまたはカメラ周はをつなぐ接続コード等を用いて、2台を同時にレリーズさせることが可能となっている。

【0004】しかしユーザには、電卓やスゴース選手など御々と状況が変わる被写体を撮影する状況下において、使用している2台以上のカメラの内、1台のカメラのみをレリーズさせたいという要望や、該2台以上のカメラのレリーズを各々一定時間ずらして交互に撮影を行いたいという要望がある。

【0005】これらの要望に對して、上記ケーブルレリーズや接続コードでは、常に2台のカメラを同時にレリーズしてしまうため、ユーザのニーズに対して十分に対応できないという問題がある。さらに常に複数のカメラを同時にレリーズさせているのは、無駄にフィルムを消費してしまつたため、経済的に効率的な良い撮影が行うことができない。

【0006】また、1台のカメラを使用して連続撮影を行うこともある。連続撮影においては、高速で連続撮影ができること、すなわち単位時間あたりの撮影コマ数が多いことが望ましい。しかし、カメラの種類によつては、フィルムの巻き上げ速度の違いのものがあつて、そのようなカメラであっても、高速で連続撮影を行いたいというユーザの要望があつた。

【0007】さらに連続撮影を行うにあたり、一般的によく使用されている36枚巻りの35mmフィルムを使用した場合、すぐに枚数分が尽きてしまひ、こまめにフィルムを取り換えなければならぬ時間がかかつてしまふという問題があつた。

【0008】【發明が解決しようとする問題】そこで本發明は上記の事情に鑑み、離れた場所にある2台以上のカメラのレリーズタイミングを1台のカメラの操作で任意に制御することができ、真実的な撮影コマ数を増やすと共に、高速で連続撮影を行うときと同じ効果を得ることができ、撮影システムを簡便することを目的とする。

【0009】

【課題を解決するための手段】このため、請求項1に記載の撮影システムは、少なくとも1台のカメラが第2のカメラとを備える。そして第1のカメラは、第1の撮影手段と、制御手段と、第2のカメラにレリーズを指示す

るレリーズ信号を送信する第1の送信手段と、該操作手段の所定の操作に応じ、前記送信手段によりレリーズ信号を前記第2のカメラに送信する第1の制御手段とを有し、第2のカメラは、第2の撮影手段と、第1のカメラからのレリーズ信号を受信する第1の受信手段とを有する。第2の撮影手段は、前記第1のカメラからレリーズ信号を受信する第1の受信手段と、第1のカメラの請求項1に記載の撮影システムによれば、第1のカメラのレリーズボタンを押すことで、第2のカメラのみをレリーズさせることができる。

【0010】さらに、第1のカメラと第2のカメラとを交互にレリーズさせることも可能である（請求項2）。【0011】また請求項3に記載の撮影システムによれば、上記所定の操作は、操作手段を非操作状態から操作状態に移行することを繰り返す操作であり、上記制御手段は、操作手段が非操作状態から操作状態に移行する毎に、第1の撮影手段による撮影と、第1の送信手段によるレリーズ信号の送信を交互に実行することができる。

【0012】また請求項4に記載の撮影システムによれば、上記所定の操作は、操作手段を所定の状態に保持する操作であり、上記制御手段は、この所定の状態が保持されている間は、第1の撮影手段による撮影と、第1の送信手段によるレリーズ信号の送信とを、交互に実行することができる。

【0013】また請求項5に記載の撮影システムによれば、上記所定の操作は、非操作状態から操作状態へ移行させる1回の操作であり、上記制御手段は、該1回の操作が行われると、第1の撮影手段による撮影と、第1の送信手段によるレリーズ信号の送信とを、所定回数だけ交互に実行することができる。

【0014】なお本發明にかかると撮影システムでは、第1のカメラは、上記の所定回数を任意に設定するレリーズ回数設定手段を有することが望ましい（請求項6）。さらに該第1のカメラは、第1の撮影手段による撮影と、第1の送信手段によるレリーズ信号の送信とを、第1の送信手段によるレリーズ信号の送信を有するタイミグとを、それぞれ任意に設定するタイミグ設定手段を有することが望ましい（請求項7）。

【0015】請求項8に記載の撮影システムは、第2のカメラは、レリーズの準備が完了したことを知らせるレリーズ準備完了信号を第1のカメラに送信する第2の送信手段を有し、第1のカメラはレリーズ準備完了信号を受信する第2の受信手段を有し、第1のカメラの制御手段は、レリーズ準備完了信号を受信するまでは、前記第1の送信手段によるレリーズ信号の送信を実行しないことを特徴とする。

【0016】この撮影システムによれば、第1のカメラの制御手段は、第2のカメラがレリーズ準備を完了したことを確認してから第2のカメラに對してレリーズ信号を送信するため、第1のカメラから離れた場所に設けた

第2のカメラによる撮影も、確実に行うことができる。【0017】請求項8に記載の撮影システムでは、第1のカメラは、所定の撮影信号を第2のカメラに送信し、第2のカメラは、該所定の撮影信号を受信した後に、第2の送信手段によりレリーズ準備完了信号を該第1のカメラに送信する（請求項9）。

【0018】請求項10に記載の撮影システムによれば、少なくとも第1のカメラと第2のカメラとを備え、そして第1のカメラは、第1の撮影手段と、操作手段と、第2のカメラにレリーズを指示するレリーズ信号を送信する第1の送信手段と、操作手段の所定の操作に応じ、第1の撮影手段による撮影と第1の送信手段によるレリーズ信号の送信とを実行する制御手段と、第1の送信手段による撮影と第1の送信手段によるレリーズ信号の送信との間隔ΔTを任意に設定する撮影間隔設定手段とを有する。また第2のカメラは、第2の撮影手段と、第1のカメラからのレリーズ信号を受信する第1の受信手段とを有する。該制御手段は、第1の送信手段による1回目の撮影を実行してから間隔ΔTを超過した後に前記第1の送信手段によるレリーズ信号の送信を実行し、また第1の送信手段によるレリーズ信号の送信を実行してから間隔ΔTを超過した後に前記第1の送信手段による2回目の撮影と、該第2の撮影手段は、第1のカメラからレリーズ信号を受信すると撮影を実行する。

【0019】

【効果の発生の形態】以下、本發明の實施形態について説明する。図1は、本發明に係る撮影システム200を表したブロック図である。撮影システム200は、通信機能付きカメラ（以下、単にカメラという）100A、カメラ100B、ケーブル300から構成されている。図2は、撮影システム200を表したブロック図である。

【0020】図1で示すように、カメラ100Aは接続端子1、モードダイヤル2a、モードボタン2b、LCD表示部3、レリーズボタン4、選択ダイヤル5、を有している。さらに図2で示すように、カメラ100Aはメモリ6、CPU10、シャッタ機構20を有しており、レリーズボタン4、メモリ6、シャッタ機構20はそれぞれCPU10と接続されている。また、接続端子1はインターフェースを介して、モードダイヤル2a、モードボタン2b、選択ダイヤル5はインターフェース8を介して、LCD表示部3はドライバ9を介して、それぞれCPU10と接続されている。なお、カメラ100Bの構成は、カメラ100Aの構成と同であるため、説明は省略する。

【0021】CPU10は、ユーザがモードダイヤル2a、モードボタン2b、選択ダイヤル5を使用して設定する内容（例えば、露出モードや撮影モード等）をインターフェース8を介して記憶する。さらにCPU10

は、設定内容や設定されて現在行っている処理の内容などをデータとしてドライバ9に送信することでLCD表示部3に表示させる。従つてユーザは、LCD表示部3で処理の内容や設定の状態を目で確認しつつ各種設定作業や撮影等を行うことができる（図3参照）。

【0022】ケーブル300は、両端にコネクタ31が設けられている。各コネクタ31をカメラ100A、カメラ100Bのそれぞれの接続端子1に挿入することで、カメラ100Aとカメラ100Bとを電気的に接続し、レリーズに關する双方向の通信を可能とする。

【0023】通常、カメラ100Aまたはカメラ100Bを単体で使用する場合、それぞれのレリーズボタン4を全押しすると、各カメラ100A、100B内でCPU10がそれぞれシャッタ機構20にのみレリーズを指示する。しかし後述するように、ケーブル300を用いて接続し、両カメラの通信機能を動作させて撮影する場合には、メイン機となる一方のカメラのレリーズボタン4を全押しすると、該メイン機のCPU10は、自機のシャッタ機構20にレリーズを指示するだけではなく、ケーブル300を介して、サブ機となる他方のカメラのCPU10にレリーズ信号を送信する。すなわち、メイン機の操作によつてサブ機のレリーズも指示することが可能となる。

【0024】なお本明細書では便宜上、カメラ100Aをメイン機とし、カメラ100Bをサブ機として説明する。以下は、特に記載がない限り、メイン機であるカメラ100Aに關する説明である。

【0025】次に撮影機の設定作業について説明する。図1は、モードダイヤル2a、モードボタン2b、選択ダイヤル5を使用して撮影環境を設定する場合のLCD表示部3の表示内容を示した遷移図である。まずユーザは、電源がオフ状態にある、カメラ100Aと100Bとをケーブル300で接続した後、両カメラの電源をオンにする。

【0026】ユーザの上記の作業により、各カメラ100A、100BのCPU10は自動的に通信機能（動作させ、各LCD表示部3に「COM」および「HEC」の文字を表示させる（D1）。なお、「COM」表示は、通信機能を用いて撮影を行うことを意味し、「HEC」表示は、通信機能による撮影を行う際にサブ機のレリーズ準備状態を確認する作業を行うことを意味する。

【0027】LCD表示部3がD1の状態の時、「CHK ECK」文字を表示させたまにすると、撮影時にカメラ100Bのレリーズ準備状態を確認するチェックモードを選択することになる。D1の状態の時、メイン機となるカメラ100Aの選択ダイヤル5を用いて「CHK」文字を表示させない、撮影時にカメラ100Bのレリーズ準備状態を確認しない非チェックモードを選択することになる。レリーズ準備とは、フィルムの巻き

上げやシャッター等を取扱し、リリース準備が完了しているカメラは、すぐにリリースが行える状態にある。

【0028】チェックモードを選択すれば、CPU10は、自機およびカメラ100Bがリリースできる状態になるのを確認してからリリースを指示するため、機内に両方のカメラのシャッターを切ることもできる。一方、非チェックモードを選択すると、CPU10は、自機およびカメラ100Bがリリースできる状態になるかどうかを確認せずに、常にユーザが設定した所望の時間が経過すると同時にリリースを指示する。

【0029】2つのモードを比較すると、リリースを指示するタイミングという点に関しては、非チェックモードの方がより正確であると言える。しかしリリース指示通りに両カメラのシャッターを切ることもできるかという点に関しては、チェックモードの方がより確実であると見える。従って通常は、チェックモードを選択する方が望ましい。

【0030】ユーザがカメラ100Bのリリース状態の瞬間について任意のモードを選択してモードボタン2bを押すと、LCD表示部3には撮影モード選択画面(D2~D4)が表示される。なお図3に示す表示内容は、全てチェックモードを選択した状態になっている。

【0031】D2~D4では、モードダイヤル2aを回転させることにより、撮影モードを選択する。カメラ100Aやカメラ100Bを単体で使用する場合、撮影モードは、1コマ撮影モードを所定カメラから選択する。なおユーザが撮影モード200で通信機能を動作させている場合には、撮影モードは、連続撮影モード(D2;第1実施形態)、インターバル撮影モード(D3;第2実施形態)、1コマ撮影モード(D4;第3実施形態)の中からいずれか1つを選択することになる。以下、各撮影モード値に設定作業を説明する。

【0032】第1実施形態である連続撮影モード(D2)は、各カメラ100A、100Bを連続してリリースさせる撮影モードである。図3において、選択ダイヤル6によって連続(D2)を選択し、モードボタン2bを1回押すと、連続撮影モードの詳細設定画面(D2a)が表示され、連続撮影方法の設定作業を説明する。本実施形態では連続撮影方法はノーマルとシクロとの2種類がある。

【0033】ノーマルとは、リリースボタン4を全押ししている間、各カメラ100A、100Bに対して予め決定された間隔(ΔT)をとりつつ、交互にリリース指示を出し続ける連続撮影方法で、いわゆるフィルムの巻き上げの速いカメラを用いて高速連写を行った場合と同様の効果を得ることができる。なお本実施形態では上述したように、メイン機、サブ機とも両方のカメラを駆用している。従ってΔTは、1のカメラがリリースを

している間に他のカメラがリリース準備を完了でき、時間の無駄なく連続撮影ができるように、カメラ100A(およびカメラ100B)がリリース準備を行うために必要な時間の2分の1の時間に設定されている。

【0034】シクロとは、リリースボタン4の操作はノーマルと同じであるが、2台のカメラ100A、100Bを同時にリリースさせることができる連続撮影方法である。シクロ撮影を行えば、同じタイミングで異なるアングルから連続撮影を行うことができる。

【0035】詳細設定画面(D2a)では、ユーザは選択ダイヤル6を回転することで上記2種類の連続撮影方法の中から1つを選択し、モードボタン2bを押して所望の連続撮影方法を設定する。

【0036】第2実施形態であるインターバル撮影モード(D3)は、ユーザが1回リリースボタン4を全押しして押すと、後述する作業で設定したリリースタイミング(時間)、リリースインターバル(時間)に従って、所望の回数だけ各カメラ100A、100Bをリリースさせる撮影モードである。ここでリリースタイミングとは、メイン機がリリースした後にサブ機がリリースするまでの時間差を意味する。またリリースインターバルとは、メイン機が1回のリリースをした後に、次のリリースをするまでの間隔を意味する。

【0037】図3において、選択ダイヤル6によってインターバル(D3)を選択し、モードボタン2bを1回押すと、リリースタイミングを設定するリリースタイミング設定画面(D3a)が表示される。リリースタイミング設定画面(D3a)では、デフォルトとして00s(秒)が表示される。ユーザは、選択ダイヤル5を回転することによって数値を増減させて所望のリリースタイミングを選択し、モードボタン2bを押して所望のリリースタイミングΔTを設定する。

【0038】本実施形態ではリリースタイミングは0s(秒)から一定の間隔で12h(時間)まで設定することが可能である。ここで、リリースタイミングΔTを0sに設定すると2つのカメラ100A、100Bを同時にリリースさせるインターバル撮影を行うことができ。なお、選択ダイヤル5を1方向に回転し続けることでLCD表示部3に表示される単位が、s(秒)・m(分)・h(時間)の順に変わっていく。

【0039】リリースタイミングΔTの設定が終了すると、次にリリースインターバルを設定するリリースインターバル設定画面(D3b)が表示される。リリースインターバル設定画面(D3b)では、デフォルトとして01s(秒)が表示される。リリースタイミング設定するときと同様の作業により、所望のリリースインターバルΔTを設定する。なお、本実施形態ではリリースインターバルは1s(秒)から一定の間隔で12h(時間)まで設定することが可能である。また選択ダイヤル5を1方向に回転し続けることでLCD表示部3に

表示される単位が、s(秒)・m(分)・h(時間)の順に変わっていく。

【0040】リリースインターバルΔTの設定が終了すると、カメラ100Aとカメラ100Bとのリリースの合計回数を設定するリリース回数設定画面(D3c)が表示される。リリース回数設定画面(D3c)では、デフォルトとして1(回)が表示される。リリースタイミングを設定したときと同じ作業で所望のリリース回数Mを選択し設定する。本実施形態では35mmフィルムを最大枚数で巻いて1回から72回まで設定が可能にしている。なおリリースタイミング設定画面(D3a)で、リリースタイミングΔTを0sに設定した場合、撮影中にCPU10は2つのカメラ100A、100Bのリリースを同時にカウントするためリリース回数は偶数のみ設定することができる。

【0041】第3実施形態である1コマ撮影モード(D4)は、ユーザがリリースボタン4を1回全押しして押す毎に各カメラ100A、100Bに対し交互にリリース指示を1回ずつ出す連続撮影方法で、ユーザは任意の時に1の操作で2台のカメラ100A、100Bをリリースさせることができる。

【0042】連続撮影モードにおける連続撮影方法(D2a)の設定、インターバル撮影モードにおけるリリース回数(D3c)の設定が終了すると、CPU10はLCD表示部3に設定終了画面(D5)が表示され、撮影準備が整った状態であることをユーザに知らせる。また、1コマ撮影モードを選択する場合には特に詳細な設定は行わないため、図3において選択ダイヤル5によって1コマ(D4)を選択し、モードボタン2bを1回押すと、LCD表示部3に設定終了画面(D5)が表示される。

【0043】上述した撮影環境の設定作業中、チェックモードの選択を行いモードボタン2bを押すと(図3中、D1参照)、CPU10はサブ機であるカメラ100BのCPU10に対して、リリースに関し通信を行うことと撮影する通信制御信号(COM信号)を送信する。またCPU10は、チェックモードが選択されているとすると、COM信号と同時にリリース準備状態をチェックすることを知らせるチェック信号を送信する。図3は、各実施形態においてカメラ100BのCPU10が行う処理を表したフローチャートである。カメラ100AからCOM信号を受信した(S201)カメラ100BのCPU10は、通信機能を用いた撮影中はサブ機として自動的にメイン機からの指示を待機する状態になる(S203)。従って、本実施形態において、カメラ100Bの方で特別な設定作業をする必要はない。

【0044】S203の処理で、メイン機からの指示を待機する状態になったカメラ100BのCPU10は、カメラ100AのCPU10に対し、サブ機として待機した状態にあることを知らせる待機番号を送信する(S

205)。そして、カメラ100AからCOM信号と同じ時にチェック番号を受信したかどうかを確認し(S207)、チェック番号を受信していれば(S207:YES)リリース処理(1)を行い(S209)、チェック番号を受信していなければ(S207:NO)リリース処理(2)を行う(S211)。S209のリリース処理(1)を示したフローチャートが図1の上段であり、S211のリリース処理(2)を示したフローチャートが図1の下段である。

【0045】このように撮影環境の設定を行うことで、以下に説明するような様々な種類の撮影を行うことができる。なお、連続撮影モードにおいて設定した連続撮影方法、インターバル撮影モードにおいて設定したリリースタイミングΔT等は、全てメモリ6にユーザデータとして保存される。ユーザデータは、撮影時にCPU10が読み出して、リリース指示をするために使用するだけでなく、次の撮影環境の設定を行う際のデフォルト値として用いられる。

【0046】次に、本発明にかかる撮影システム200を用いて撮影する場合のカメラ100AのCPU10が行う処理を各実施の形態毎に分けて説明していく。

【0047】まず第1の実施形態である、連続撮影モードによる撮影の説明をする。図4と図5は連続撮影をする際にCPU10が行う処理を示したフローチャートである。

【0048】図4は、連続撮影方法をノーマルに設定した場合にCPU10が行う処理を示したフローチャートである。ユーザによってリリースボタン4が全押しされるまで待機状態にある(S1:NO)CPU10はリリースボタン4が全押しされると(S1:YES)、自機のリリース準備が完了している状態にあるかどうかを判断する(S3)。そしてリリース準備が完了していると判断すると(S3:YES)、シャッター機構20に対してリリースを行うように指示する(S6)。これにより、カメラ100Aによる撮影が行われる。

【0049】リリースを指示(S6)した後、まだリリースボタン4が全押しされている状態にあるかどうかを判断する(S7)。リリースボタン4が既に押されているければ(S7:NO)、カメラ100Bに終了信号を送信して(S21)撮影を終了する。

【0050】一方、リリースボタン4がまだ全押しされた状態にある場合には(S7:YES)、CPU10は所定の時間ΔTをカウントする(S9)。次にチェック番号が設定されていれば(S11:YES)、カメラ100Aからリリース準備完了信号(図10中、S235参照)を受信しているかどうかを判断する(S13)。カメラ100Bからリリース準備完了信号を受信していれば(S13:YES)CPU10は、カメラ100Bのリリース準備は完了していると判断し、カメラ100BのCPU10にリリース信号を送信する(S1

理により、カメラ100Aとカメラ100Bとは同時にシャッタを切ることができる(図10中、S241参照)。

[0076] S97において、非チェックモードが設定されている場合(S97:NO)、CPU10は、カメラ100Bのレリーズ機構の完了を判断することなくカメラ100Aのシャッタ機構20に対してレリーズを行うように指示すると同時に、カメラ100BのCPU10に対してレリーズ信号を送信する(S101)。S101の処理により、カメラ100Aとカメラ100Bとは同時にシャッタを切ることができる(図11中、S241参照)。

[0077] 次にCPU10はレリーズ回数Kのカウントを2回分行い、回数Kを3とする(S103)。そして回数K(ここでは3)が、所望の設定回数Mを越えた(すなわち、M=2)場合、設定回数Mだけレリーズが行われたことになり(S105:YES)、CPU10は、カメラ100Bに終了信号を送信する(S109)。回数Kが所望の設定回数Mを越えない(ここで、M=4以上)場合(S105:NO)は、S101で行ったレリーズ指示からメモリ6に記憶されている所望のレリーズインターバル ΔT が経過した後に、S95からの処理を繰り返す(S107:YES)、所望の設定回数Mだけレリーズ指示をする。

[0078] インターバル撮影モードで撮影する際に、カメラ100BのCPU10が行う処理は、既に述べた連続撮影モードで撮影する際に行う処理と同様である。すなわち、チェックモードで撮影を行う場合には図10で示す処理(1)を行い、非チェックモードで撮影を行う場合には図11で示す処理(2)を行う。従って、説明は省略する。

[0079] 以上が第2実施形態のインターバル撮影モードによる撮影の説明である。インターバル撮影を行うと、レリーズボタン4を1回全押しして終了(51:YES)、接続されている2つのカメラ100A、100Bのレリーズの合計が所望の回数になるまで(S61、S73)、両カメラのレリーズを交互に行わせる(S67、S69)ことができる。しかも、カメラ100Aのレリーズとカメラ100Bとの間は、所望のレリーズタイミング ΔT をとることができる(S6)。さらに1回目のカメラ100Aのレリーズと2回目のカメラ100Aのレリーズとの間は、所望のレリーズインターバル ΔT をとることができる(S76)。

[0080] またレリーズタイミング ΔT を0sに設定してインターバル撮影を行うと、ユーザがレリーズボタン4を1回全押しして終了(S91:YES)、接続されている2つのカメラ100A、100Bのレリーズの合計が所望の回数になるまで(S105)、両カメラのレリーズを同時に切らせる(S101)ことができる。しかも1回目のレリーズと2回目のレリーズとの間

に所望のレリーズインターバル ΔT をとることができる(S107)。

[0081] 次に第3の実施形態である、1コマ撮影モードによる撮影の説明をする。図8は、1コマ撮影する際にCPU10が行う処理を示したフローチャートである。待機状態にある(S121:NO)CPU10は、ユーザがレリーズボタン4を1回全押ししてから離すと(S121:YES)、自機がレリーズ機構の完了している状態にあるかどうかを判断すると(S123)。そしてレリーズ機構が完了していると判断すると(S23:YES)、シャッタ機構20に対してレリーズを行うように指示する(S125)。これにより、カメラ100Aによる撮影が行われる。

[0082] S125でシャッタ機構20にレリーズ指示を行ったCPU10は、ユーザが再度レリーズボタン4を1回全押ししてから離したかどうかの判断を行う(S127)。CPU10は、レリーズボタン4が全押しされるまでは待機状態にある(S127:NO)が、レリーズボタンが再度全押しされる(S127:YES)と、チェックモードが設定されている(S129:YES)、カメラ100Bからレリーズ機構完了信号(図10中、S235参照)を受信しているかどうかを判断する(S131)。カメラ100Bからレリーズ機構信号を受信していれば(S131:YES)、CPU10はカメラ100Bにレリーズ信号を送信する(S133)。このレリーズ信号に同期してカメラ100Bによる撮影が行われる(図10中S241参照)。

[0083] S129において、非チェックモードが設定されている場合(S129:NO)には、CPU10は、カメラ100Bのレリーズ機構の完了を判断することなくすぐにカメラ100BのCPU10にレリーズ信号を送信する(S133)。このレリーズ信号に同期してカメラ100Bによる撮影が行われる(図11中S241参照)。

[0084] レリーズ信号送信後CPU10は、再びレリーズボタン4が全押しされるまで待機状態になり(S121:NO)、レリーズボタン4が全押しされると、S123からの処理を繰り返すこととなる(S121:YES)。

[0085] なお、1コマ撮影モードで撮影を行う際には、カメラ100BのCPU10が行う処理は、カメラ100AのCPU10から終了信号の送信はされないため、図10および図11中、S237の処理で常にNOと判断されるという点以外は、上述した第1の実施形態と第2の実施形態とで行う処理と同様である。

[0086] 以上が第3実施形態の1コマ撮影モードによる撮影の説明である。1コマ撮影を行うと、ユーザが所望のタイミングでレリーズボタン4を1回全押しして終了(51:YES)は自機のレリーズ指示(S125)とカメラ100Bへのレリーズ信号送信(S133

3)とを交互に行うため、2台のカメラ100Aとカメラ100Bとを1台のカメラの操作で交互にシャッタを切らせることができる。

[0087] なお、上記の各実施形態においてはサブ機も通信機能付きカメラを使用して説明しているが、最も低限メイン機が本発明にかかる通信機能付きカメラであれば、サブ機は通信機能を有していないカメラであってもよい。ただしその場合、サブ機からはレリーズの準備状態などを送信することはできないので、撮影時は非チェックモードに設定されることになる。

[0088] 以上が本発明にかかる撮影システム200の実施形態の説明である。本発明にかかる撮影システムは上記の実施形態に限定されるものではなく、本発明の主旨を逸脱しない範囲で種々の変形が可能である。

[0089] 例えば上記の各実施形態では、カメラ100Aとカメラ100Bの2台を使用して通信を行っているが、2台以上のカメラを使用し、サブ機を複数設けることも可能である。そのため両カメラの接続に用いるケーブル30を、途中でいくつかに分岐して枝分かれ状態になっているケーブルであったり、外部線を利用してコードに変形することも可能である。

[0090] 本発明に使用するカメラは、36枚撮りの35mmフィルム用のカメラや中判フィルム用のカメラのみならず、APSカメラやデジタルカメラ等、様々な種類のカメラを使用することができる。

[0091] よって、使用するカメラやフィルムの種類および撮影機構等によってレリーズタイミングやレリーズインターバル等の設定可能範囲や、その他撮影環境の設定内容を変更することができる。例えば、上記実施形態中では、連続撮影のメイン機とサブ機とのレリーズの間隔(ΔT)を、カメラ100A(100B)のレリーズ準備を行うために必要な時間の2分の1の時間に予め設定しているが、これに限定されることはない。間隔 ΔT も、撮影環境設定時にユーザが任意の数値に設定することも可能である。

[0092] また本発明に係る撮影システムは上述した3種の撮影モードを全て有する必要はない。例えば、第2実施形態のインターバル撮影モードのみを有する撮影システムであってもよい。さらに本発明に係る撮影システムは上述した3種の撮影モードにのみ適用されるものではない。例えばセルフタイマー撮影モードを有する撮影システムであれば、複数のカメラを使用して、異なるアングルからの被写体を同時にセルフタイマー撮影をすることや、設定した時間ををもって順次セルフタイマー撮影をすることも可能となる。

[0093] なお本発明で使用する通信機能付きカメラには、各実施形態とは独立して、常に自機に接続されているサブ機のみをレリーズさせることができる通信レリーズ専用ボタンを設けるような変形も可能である。

[0094]

[発明の効果] 上述の通り本発明の撮影システムは、ユーザが設定した所望の撮影環境の下、カメラ同士間でレリーズに関する情報を通信することにより、複数のカメラのレリーズを常に一定のタイミングで連続して行うことが可能となる。

[0095] 従って例えば、画質は高いものの巻き上げが遅いため、高速連写ができなかった中判フィルムを搭載するカメラであっても、本発明にかかる撮影システムを使用して複数接続することにより、高速連写を行った場合と同一の撮影効果を得ることができる。

[0096] また、撮影枚数の少ないフィルムを搭載するカメラであっても、本発明にかかる撮影システムで複数接続された状態にすることにより、撮影途中でこまめにフィルム交換をするためにインターバルを中断する必要もなくなり、長時間インターバル撮影を行うことができる。

[図面の簡単な説明]

[図1] 本発明の撮影システム200を表したブロック図である。

[図2] 本発明の撮影システム200を表したブロック図である。

[図3] モードダイヤル2a等を用いても種設定を行う場合におけるLCD表示部3に表示される内容を表した遷移図である。

[図4] 第1実施形態の、撮影方法をノーマルに設定して連続撮影をする際のカメラ100AのCPU10が行う処理を示したフローチャートである。

[図5] 第1実施形態の、撮影方法をシフトに設定して連続撮影をする際のカメラ100AのCPU10が行う処理を示したフローチャートである。

[図6] 第2実施形態の、レリーズタイミング ΔT を0s以外の値に設定してインターバル撮影をする際のカメラ100AのCPU10が行う処理を示したフローチャートである。

[図7] 第2実施形態の、レリーズタイミング ΔT を0sに設定してインターバル撮影をする際のカメラ100AのCPU10が行う処理を示したフローチャートである。

[図8] 第3実施形態のカメラ100AのCPU10が行う処理を示したフローチャートである。

[図9] 各実施形態のカメラ100BのCPU10が行う処理を示したフローチャートである。

[図10] チェックモードで撮影を行う場合にはカメラ100BのCPU10が行う処理(1)を示したフローチャートである。

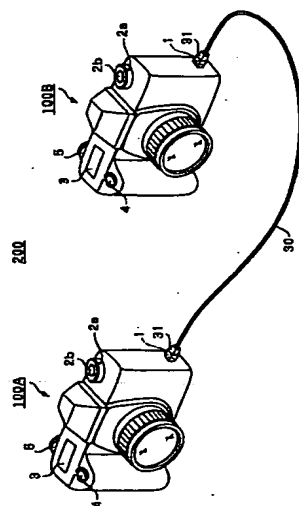
[図11] 非チェックモードで撮影を行う場合にはカメラ100BのCPU10が行う処理(2)を示したフローチャートである。

[符号の説明]

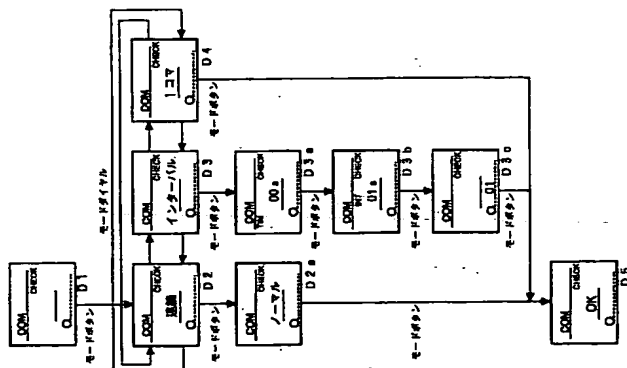
1 接続端子

- 2a モードダイヤル
2b モードボタン
3 LCD表示部
4 レリーズボタン
5 選択ダイヤル
10 CPU
- 20 シャッター機構
30 接続ケーブル
31 コネクタ
100A、100B 通信機能付きカメラ
200 撮影システム

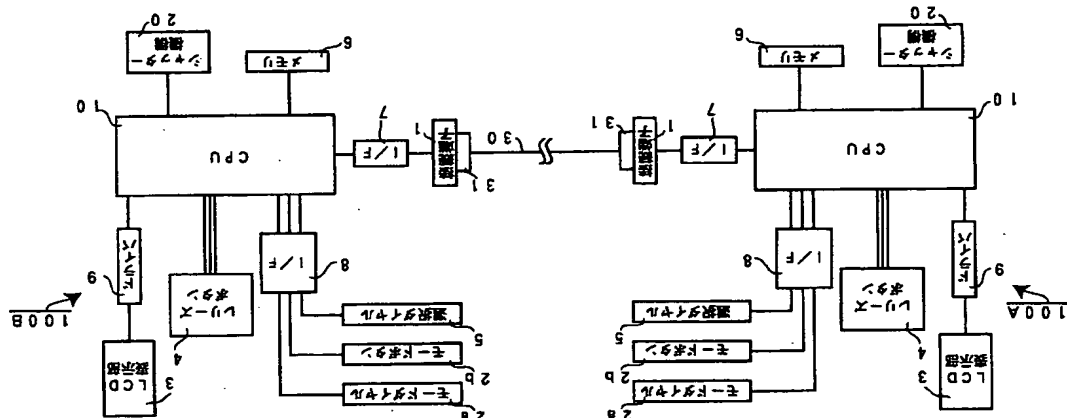
【図1】



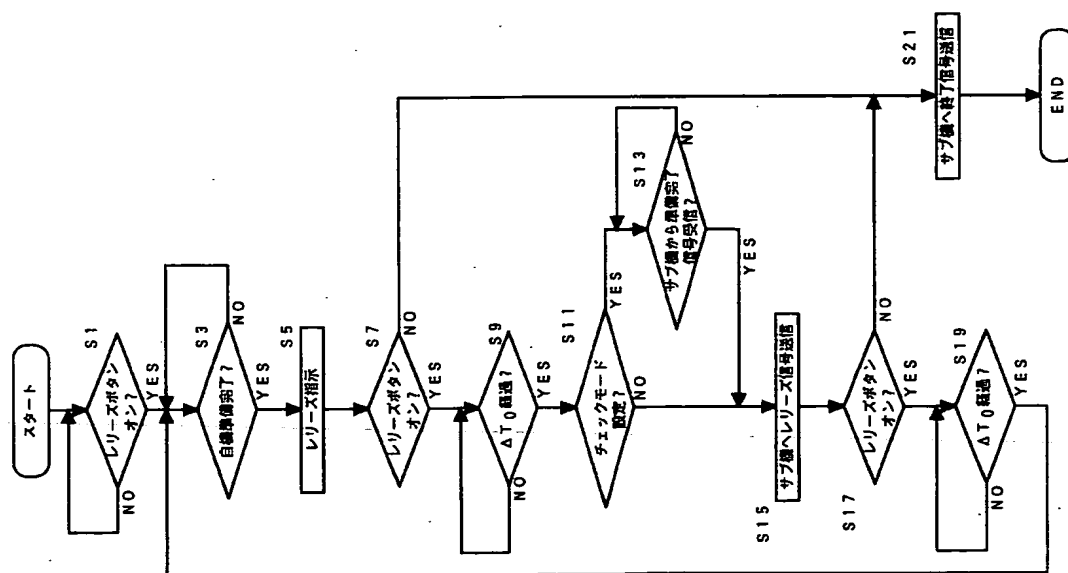
【図2】



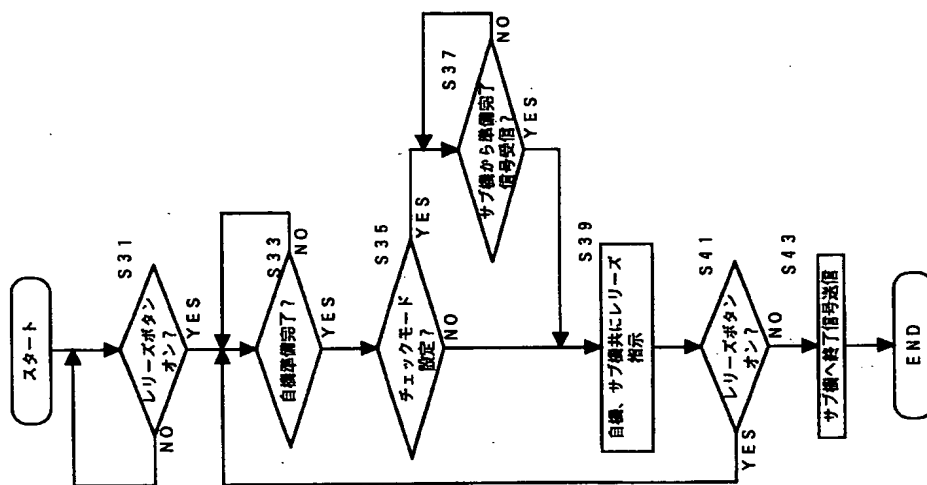
【図2】



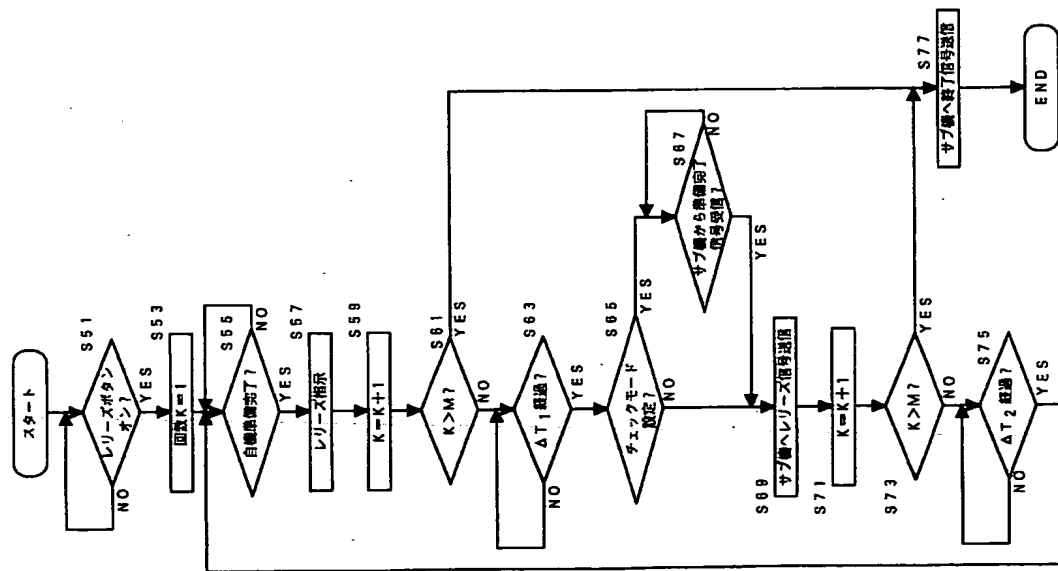
【図4】



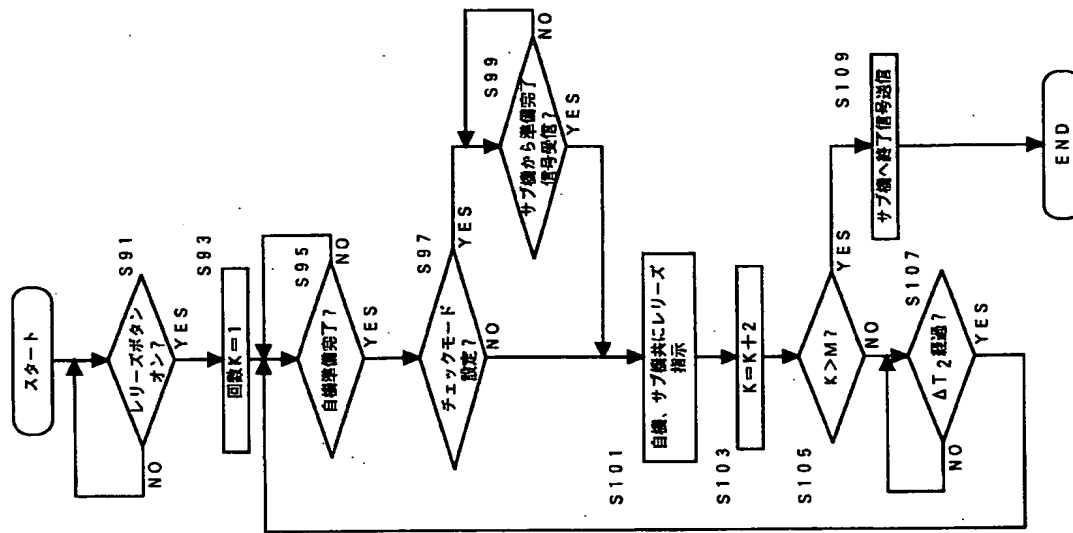
【図5】



【例6】



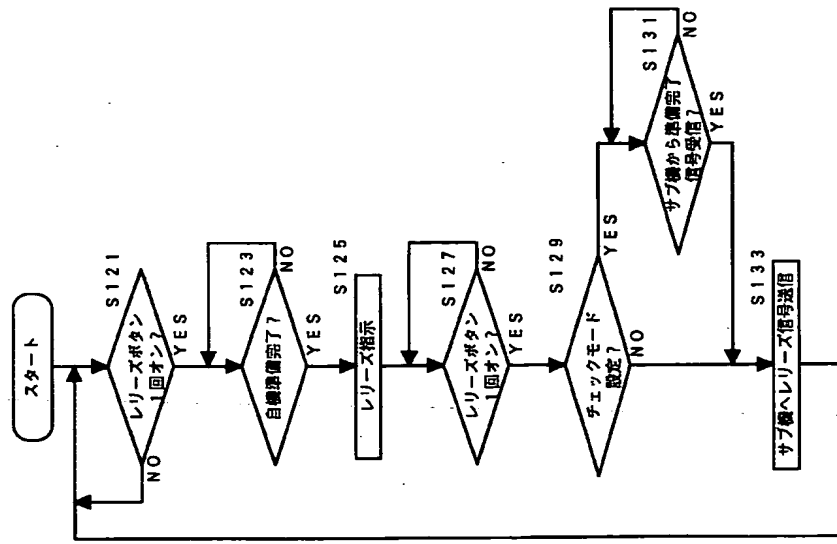
【28】



(17)

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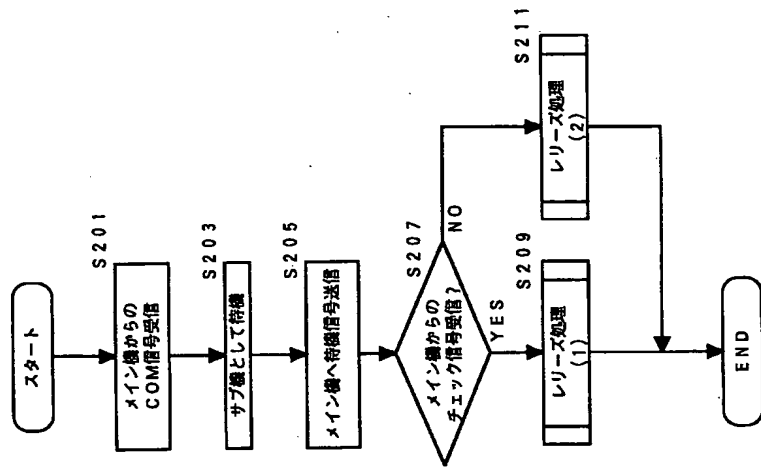
【図8】



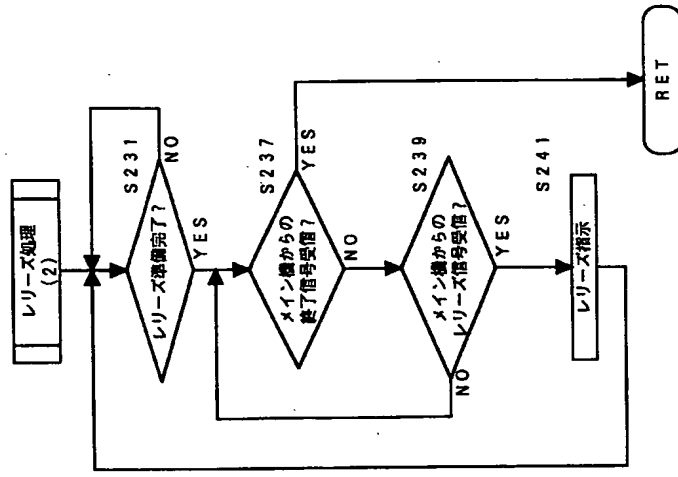
(18)

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【図9】



【図11】



【図10】

